

An Unmanned Aircraft System and Photogrammetry Technique Used to Map Reclamation of Stream Channel and Canyon Valley of an Abandoned Coal Mining Site in New Mexico.

L. S. DeLay

Mining and Minerals Division, New Mexico Energy, Minerals and Natural Resources Department, Santa Fe, New Mexico, U.S.A -
linda.delay@state.nm.us

KEY WORDS: Unmanned Aerial System, UAS, Photogrammetry, Remote Sensing, Topographic Model, Vegetation Map, Geomorphic Reclamation, Abandoned Coal Mining Site

ABSTRACT:

The Dillon Canyon/Swastika Mine and Dutchman Canyon on the Vermejo Park Ranch in Northern New Mexico are part of a larger historic coal mining site. The valley and drainages therein have been reformed to simulate more natural processes, a geomorphic reclamation technique. Coal waste had been redistributed and covered with topsoil, drainages reformed, and conditions created to re-establish wetland development as a result of a New Mexico Abandoned Mine Land Program project. Stream morphology is expected to be dynamic and change over time. The establishment of vegetation after seeding, planting, and natural establishment was initiated in 2013. Evaluation of reclamation success of the wetlands and upland vegetation for 4-5 years include monitoring with use of vegetation transects and stream channel profiles. Deployment of a fixed-wing unmanned aircraft system with multispectral camera at the site and use of photogrammetric methods was used to create a digital topographic model. Resulting four band (including NIR) orthophotography was used as input into a land cover classification. The end product resolution and accuracy was compared to traditional methods.